

LASIUS XEROPHILUS (HYMENOPTERA: FORMICIDAE),  
A NEW ANT SPECIES FROM WHITE SANDS NATIONAL  
MONUMENT, NEW MEXICO

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ABSTRACT

We describe a new species of the ant genus *Lasius* collected from the arid Chihuahuan Desert, a very unusual habitat for the genus. The workers, females and males of this species are similar to those of *L. neoniger*, but have more abundant erect hairs on the tibiae.

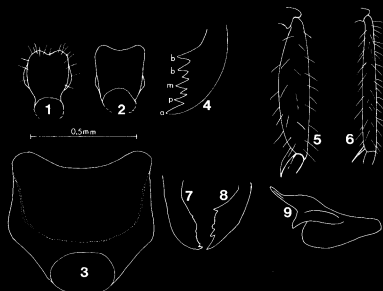
INTRODUCTION

*Lasius* is one of the most prominent and familiar of the Holarctic ant genera (Wilson 1955). It generally occurs at high elevations or high latitudes in forests and grasslands. We describe a species which occurs in the arid Chihuahuan Desert of south central New Mexico, a habitat which is very unusual for the genus. The genus *Lasius* commonly occurs in mesic sandy habitats, including sand dunes (Boomsma and De Vries 1980; Gallé and Szönyi 1988; Gallé 1990, 1991).

*Lasius xerophilus* new species

(Figures 1-7, 9)

**Diagnosis.** This species is similar to *L. neoniger*, and would key to this species in Wilson (1955). **Worker:** The worker is covered with short, bristly hairs. The extensor surface of the front tibia (Fig. 5) has at least 6, usually over 10 such hairs (as many as 3, usually one or none in *L. neoniger*), the same surface of the mid



Figs. 1-7 and 9: *Lasius xerophilus*, Fig. 8: *Lasius pallitarsis*. 1. Posterior view of petiole of paratype *L. xerophilus* worker. 2. Similar view of petiole of *L. xerophilus* male paratype. 3. Similar view of petiole of paratype female *L. xerophilus*. 4. Left mandible of *L. xerophilus* paratype worker, b = basal, m = median, p = preapical and a = apical. 5. Anterior view of front tibia of paratype *L. xerophilus* worker. 6. Similar view of posterior tibia of *L. xerophilus* paratype worker. 7. Right mandible of paratype male *L. xerophilus*. 8. Left mandible of *Lasius pallitarsis* male (NM, Los Alamos Co., 8 KN Los Alamos). 9. Right aedeagus (outer surface) of male paratype *L. xerophilus*.

tibia has over 13 (up to 14, usually less than 10 in *L. neoniger*) and the same surface of the posterior tibia (Fig. 6) has more than 15 (less than 15 in *L. pallitarsis*). **Female:** The females are much more hairy than those of *L. neoniger*, with more than 20 hairs on the extensor surface of the mid tibia and hind tibia (less than 6 on these surfaces in *L. neoniger*, based on 6 females from Quebec and Mora Co. NM). **Males:** Males are easily distinguished from those of *L. neoniger* as the extensor surface of the mid tibia has more than 5 erect hairs (one or none in two *L. neoniger* males from Quebec), the same surface of the hind tibia has more than 10 erect hairs (0-2 in *L. neoniger*).

*Description.* Worker measurements (mm): HL (head length) 0.84–0.86, HW (maximum head width) 0.80–0.83, SL (scape length) 0.75–0.79, EL (eye length) 0.20–0.21, WL (Weber's length) 0.93–0.98, CI (cephalic index,  $HW/HL \times 100$ ) 95–97, SI (scape index  $SL/HL \times 100$ ) 87–94.

Mandibles with 5 large, well defined acute teeth (Fig. 4), widely spaced with two denticles (intercalaries) between preapical (second), median (third) and first basal (fourth), apical tooth about twice size of preapical tooth, which is equal in size to remainder (Fig. 4); anterior border of clypeus broadly rounded, surface of clypeus convex, bulging; frontal area poorly defined; sides of head broadly convex, eyes reaching lateral margins, located about  $1\frac{1}{2}$  diameters from base of mandible; vertex slightly concave; scapes extending past occipital borders by about 2 funicular segments; maxillary palps long, extending nearly to foramen magnum; pronotum broadly rounded; surface joining mesonotum at same level, promesonotal suture well marked (lateral view); propodeum rectangular shaped, somewhat narrowed dorsally, well differentiated from mesonotum, dorsal face short (0.12 mm), posterior face long (0.4 mm); petiolar node concave apically (Fig. 1). Erect, coarse, bristly hairs (0.05–0.1 mm long) abundant on all surfaces (Figs. 5 & 6), golden, decumbent pubescence abundant on head, dorsum of mesosoma and gaster. Light brown, gaster darker brown. Mandibles finely striate, dorsum of head and most of mesosoma and gaster finely punctate. Posterior face of propodeum smooth and shining.

Female measurements: HL 1.46–1.48, HW 1.64–1.65, SL 1.19–1.23, EL 0.38–0.40, WL 3.18–3.26, CI 111–113, SI 81–83.

Mandible similar to that of worker, except teeth between second, third and fourth teeth larger, about half size of others; eyes large, about 1.5 diameters from base of mandibles; 3 well developed ocelli; vertex straight; scape extends past occipital corner by length of first funicular segment; petiolar node strongly bilobed (Fig. 3). Sculpture, hair and pubescence as in worker. Head and dorsum of mesosoma dark brown, side of mesosoma and gaster lighter brown.

Male measurements: HL 0.65–0.69, HW (posterior to eye) 0.68–0.74, SL 0.49–0.51, EL 0.29–0.30, WL 1.43–1.51, CI 99–113, SI 71–78.

Mandible (Fig. 7) without teeth except single angle at apex, rarely a second poorly defined tooth may be present (seen in one specimen); masticatory border broadly convex; median anterior border of clypeus broadly convex, surface convex; head wider posteriorly than anteriorly; eyes large, convex, about 1/2 diameter from base of mandible; 3 ocelli well developed; scape about as long as first 5 funicular segments; maxillary palps short, reaching about 1/3 distance to foramen magnum; petiolar node broadly concave (Fig. 2); parameres thickened, apex covered with erect hairs; aedeagus with well developed convex blade, without teeth (Fig. 9); volsella broad with digitus poorly developed. Erect, bristly hairs on all surfaces, but not as abundant as in worker and female. Punctate throughout, except for smooth surface of posterior face of propodeum. Dark brown, scapes, legs and genitalia lighter brown.

*Distribution.* United States: New Mexico, Otero Co., White Sands National Monument. Specifically, this species occurs in interdunal areas at the Visitor's Center, around the trail head to the back country campground and at the Heart of the Dunes; NM, Bernalillo Co., northwest Albuquerque, 17-iii-1993, Dick Fagerlund (4 workers, 1 in MacKay collection, 3 in Fagerlund collection); NM, Bernalillo Co., Bosque Forest, 6-iv-1990, 20-iv-1990, 7-ix-1990, Cliff Crawford (4 workers, 1 in MacKay collection, 3 in University of New Mexico collection).

*Type Series.* Holotype worker, 6 paratype workers, 1 paratype female and 6 paratype males in the U.S. National Museum, 54 paratype workers, 4 paratype females and 35 paratype males deposited in the Harvard Museum of Comparative Zoology, Los Angeles County Museum of Natural History, the American Museum of Natural History, the New Mexico Museum of Natural History, the British Museum of Natural History and in the Laboratory for Environmental Biology, University of Texas.

*Discussion.* This species was recorded from White Sands National Monument and was considered by Wilson (1955) to be *L. neoniger*, although it differed in being "exceptionally hairy and lighter in color" than typical *L. neoniger* workers. Wilson concluded that both of these characters may represent adaptations to the extreme environment at the site. This new species is a member of the *neoniger* species complex, which also includes *L. neoniger*, *L. crypticus* and *L. sitiens* (Wilson 1955). The distributions of sev-

eral related species (*L. niger*, *L. neoniger*, *L. alienus*, *L. sitiens*, and *L. crypticus*) are near to or overlap the distribution of this new species. Thus a comparison with these species is necessary to reduce the possibility of misidentifications. The workers, females and males can be distinguished by the abundant erect hairs from most others, except *L. pallitarsis*, from which the workers and females differ by not having the offset basal mandibular tooth. The workers of *L. niger* are also hairy, but can be distinguished as they are darker brown than the light yellowish brown *L. xerophilus* workers. In addition, the penultimate and terminal basal teeth are subequal in size in *L. niger*. The new species can be distinguished from *L. neoniger* by the abundant hair on the tibiae, especially the fore tibia (Fig. 10). The workers of *L. alienus*, *L. crypticus* and *L. sitiens* usually lack erect hairs on the scapes and tibiae, which easily separates these species from the new species. *Lasius crypticus* also inhabits dry, exposed situations and thrives in short-grass prairie semidesert transition (Wilson, 1955).

The males are similar to others in the *niger* species complex, differing primarily in the abundant erect hairs on the mid and hind tibiae. Males of *L. alienus*, *L. crypticus* and *L. sitiens* have few or no erect hairs on the scapes, which easily separates them from those of *L. xerophilus*.

*Etymology.* From Greek, xeros meaning dry and philia referring to love or fondness for dry habitats.

*Material examined.* Eighty-nine workers, 5 females and 48 males.

*Biology.* All specimens of this new species from White Sands National Monument were collected in the extensive sand dunes (gypsum). Small inconspicuous nests were found in interdune areas. Foraging was nocturnal and crepuscular, except on cool days, when activity continued throughout the day. Nests apparently contained about 100 workers. They appeared in habitus in the field to be a species of *Conomyrma*, although they are much slower and not very excitable. Workers were timid and attempted to hide when nests were excavated. Sexualls were found in nests in July. Flights occurred at 20:00–23:00 on July 24, 1992 at the Visitor's Center.

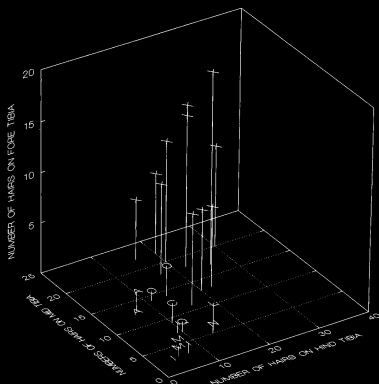


Fig. 10. A three dimensional plot of the numbers of hairs on the tibiae of two species of *Lasius*. *L. xerophilus*, all paratypes from White Sands National Monument, is represented by X's, *L. neoniger* by the other letters which indicate states and localities where the specimens were collected: A = Minnesota, C = California, I = Illinois, L = Lincoln Co., southern New Mexico, M = Michigan, N = New York, O = Mora Co., northern New Mexico and Q = Quebec.

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#### LITERATURE CITED

- Boomsma, J. J., and De Vries, A. 1980. Ant species distribution in a sandy coastal plain. *Ecol. Entomol.* 5:189-204.
- Gallé, L. 1990. Assembly of sand-dune forest ant communities. *Memorabilia Zool.* 44:1-6.
- . 1991. Structure and succession of ant assemblages in a north European sand dune area. *Holarctic Ecol.* 14:31-37.
- Gallé, L., and Szönyi, G. 1988. A check list of ants (Hymenoptera: Formicoidea) of a sandy grassland in Kiskunság National Park (Hungary). *Acta Biol. Szeged.* 34:167-168.
- Wilson, E. O. 1955. A monographic revision of the ant genus *Lasius*. *Bull. Mus. Comp. Zool.* 113:1-201 + 2 plates.